

4a and 4b have the same outer diameter as the magnet 3, but have a radial dimension that is greater than that of the magnet so as to define a storage room for ferro or magnetic fluid that is defined by an outer surface portion of a spindle or shaft 2 extending axially through the seal, bottom and top surface portions respectively of the rings 4a and 4b, and the inside diameter of the magnet 3. The spindle 2 is made of a ferromagnetic material. The magnet 3 then acts through the magnetic yoke 4a, 4b and the shaft 2 so as to cause the ferro magnetic fluid to collect in the respective gaps between the yokes 4a and 4b to form a low-friction seal. Thus, the ferro magnetic fluid is not a contaminant, but rather is **the seal**. Contrary to the Examiner's position, nothing in the patent suggests that this seal be used to collect contaminants from the lubrication fluid contained in a gear box, and in fact, U.S. Patent No. 3,740,060, which is mentioned in column 1, line 54 of Mitsuya et al., warns against using the ferro fluidic seal to seal fluids that are soluble in the ferro fluid since "it will dilute the ferrofluid causing a proportionate reduction of magnetization". The implication is that the ferro magnetic fluid will then lose its ability to adequately seal the interface of the shaft with the ferro seal. This is probably why Mitsuya et al. do not mention the ferro seal as being usable in environments where there is liquid, but rather states the "present seal is used as a dust seal, a vacuum seal or a seal for a nuclear application apparatus for confining radioactivity" (see column 1, lines 2-4).

For the reasons stated above, it is submitted that Mitsuya et al. in no way teach, and consequently do not make obvious, the combination claimed in each of claims 1 and 9, of a drive shaft mounted in a bottom wall of a lower section of a gear box, with **a seal located** for preventing leakage between the **interface of the lower wall** and the shaft, and a contaminant collector positioned above the shaft seal for intercepting ferric contaminants so as to prevent the contaminants from engaging the seal.

Claims 1 and 9 are additionally rejected, and claims 2 and 10 are rejected on the basis of 35 U.S.C. 103(a) as being unpatentable over Hauser et al. It is respectfully submitted that this rejection is in error as there is absolutely no teaching in Hauser et al. that the magnetic contaminant collector be positioned above a shaft seal for intercepting ferric contaminants as set forth in the claims.

Specifically, Hauser et al. disclose a hydrostatic transmission for a tractor including a pump 11 having a main casing 21 through the top of which is mounted a

vertical input shaft 24 (FIG. 3) coupled for driving the pistons 28 of the pump. The pump 11 is provided with a bypass valve arrangement including a pair of check balls 20 respectively at the pressure/return ports 25 of the pump. A filter housing 30 is in fluid communication with the check balls 20 and contains a filter for filtering contaminants from fluid flowing through it. A bypass operator 40 is provided for opening the check balls 20 and includes a bypass rod 52 rotated by means of an external arm 54 (FIG. 8). The rod 52 is provided with an offset crank section 53 that acts through a plunger 51 that is joined to bypass actuator 40, the actuator having tabs 46 at its opposite ends located for engaging and opening the check balls 20 in response to rotation of the rod 52. Instead of the bypass actuator 40, a member (not shown) extending directly through the bottom of the casing 21 could be located for directly engaging the tab 51. A magnet 55 is mounted on the bypass rod 52 and functions as a washer to assist in maintaining rod 52 in the housing, while also acting to filter loose metal parts from the hydraulic fluid. There is no teaching in Hauser et al. to position the magnet 55 above a seal mounted at the interface of a rotating drive shaft and a bottom wall of a gear housing so as to protect the seal from contaminants, as claimed.

Thus, it is respectfully submitted, that because Hauser et al. merely teaches placing a magnet in an oil sump to collect metal contaminants, it would not have been obvious to have located such a magnet in the acknowledged prior art arrangement of a gear box, gear drive shaft and seal, as set forth in claims 1 and 9, so as to be above the seal for preventing metal contaminants from gravitating to the seal. It appears the Examiner has used applicant's own teaching in arriving at the proposed combination to reject the claims and such hindsight has long been held impermissible.

Claims 2 and 10 respectively depend from claims 1 and 9 and are likewise thought allowable. Claims 2 and 10 are thought allowable for the additional reason that each requires the contaminant collector to be mounted to the **gear** drive shaft, and no such gear drive shaft is present in Hauser et al. While the bypass rod 52 of Hauser et al. does carry the magnet 55, the rod is not a gear drive shaft, and oscillates instead of rotates. Further, the magnet 55 is provided as a washer to prevent the rod 52 from being withdrawn from the housing 21, and no such function is performed by the magnet in applicant's disclosure.

Claims 3-4 and 11-12 are under a rejection based on 35 U.S.C. 103(a) as

being unpatentable over Hauser et al. in further view of Van De Venne et al.

Claims 3 and 4 depend either directly or indirectly from claim 2 and are thought allowable for the same reason; and claims 11 and 12 depend either directly or indirectly from claim 10 and are likewise thought allowable.

Claims 3 and 11 are thought allowable for the additional reason that each requires the contaminant collector to include a ring press fit onto the gear drive shaft, and it is not thought that it would have been obvious to one skilled in the art to have modified applicant's acknowledged prior art by press fitting the magnet onto the gear drive shaft. Because Hauser et al. do not teach the idea of connecting a magnetic contaminant collector to a gear drive shaft and would have no need to do so with the manually oscillated shaft, it would not have been obvious to have sought out a teaching, such as that disclosed in Van De Venne et al., of press fitting a component for rotation with a drive shaft. Again, it appears that the Examiner has resorted to applicant's own teaching in arriving at the combination used for rejecting claims 3 and 11.

Claims 4 and 12 respectively depend from claims 3 and 11 and are likewise thought allowable. Claims 4 and 12 are thought allowable for the additional reason that each requires the contaminant collector to include a ring having an upper surface to which is fixed a magnetic component, and no such structure is taught by either Hauser et al. or Van de Venne et al. The Examiner has taken the position that the required magnetic component is the upper surface of the magnet 25 of Hauser et al. This construction by the Examiner is not logical, since how can magnet 25, which is but a **single component**, be considered the claimed ring having an upper surface to which at least one magnetic component is integrally fixed? In other words, the magnet 25 is a ring having an upper surface. There is no magnetic structure integrally mounted to the upper surface of the magnet 25.

It is noted that the Examiner considers claims 5-8 and 13-16 to contain allowable subject matter. These claims are thought to depend either directly or indirectly from allowable claims, for the above-stated reasons.

In conclusion, it is believed that this application is in condition for allowance, and such allowance is respectfully requested.


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Respectfully,


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